THURSDAY, JANUARY 9, 1908.

THE HISTORY OF AERONAUTICS.

Histoire de la Navigation aérienne. By W. de Fonvielle. Pp. 271. (Paris: Libraire Hachette et Cie., 1907.)

THE subject of aërial navigation is steadily developing into one of importance. Invention in this line is progressing so rapidly that the expert who wishes to be up to date must perforce be busy with much new literature. The work before us, by so well-known an aëronaut as M. de Fonvielle, will, then, be eagerly sought for. The student who expects to receive full information on all the recent developments may, however, feel some disappointment when he has looked through the book, since, out of its 270 pages, only some forty are devoted to the very important work which has been accomplished during the last ten years. The rest of the book is historical, throwing, no doubt, much new light on certain points, but, as a whole, containing nothing of importance that is not to be found in older works.

The first chapter deals with the soap bubbles of Tiberius Cavallo, a story well known to Englishmen who have read that savant's most interesting book, "The History and Practice of Aërostation," which was published in London so long ago as 1785. In June, 1782, Mr. Cavallo read a paper before the Royal Society in which he described how he had attempted to fill a light paper bag with hydrogen, in order to make it float in the air, but found it impossible to retain the "inflammable air," and how he then managed to blow out soap bubbles with hydrogen which rose in the air. In the following year both hot-air balloons and gas balloons were invented in France, and the accounts of them are described by M. de Fonvielle in following chapters. Elongated "dirigible" balloons, worked by hand, were designed very soon after the first ascents, but, of course, proved of little practical use.

The chapters on the first scientific ascents refer to those of Robertson, Gay-Lussac, Barral, and Green, but the better-known and more complete work of Glaisher and Coxwell is not more than touched upon in a following chapter.

The chapter on "Les Ballons-sondes" contains much that may be of interest to modern meteorologists, since this means of studying the atmosphere is now so much employed.

Three chapters are devoted to ascents during the siege of Paris, and one to aëronautical photography, but perhaps the most complete and interesting accounts in the book are those of the *Lebaudy* and other dirigible airships. It was in November, 1902, that the first free ascent was made with that vessel, which has now proved itself to be the first really practical aërial machine. Many more trials are described, including one on July 24, when 98 kilometres were covered; on November 12, when the airship travelled 60 kilometres to Paris; and on July 3, 1905, when a journey of 96 kilometres was performed in 3 hours 21 minutes.

The last chapter, on the development of aërial navigation, is somewhat disappointing, for after referring to the *Patrie* and the *Ville de Paris*, the two most recent practical airships in France, it recounts shortly what has been attempted in this line in other countries, but makes no reference to the important experiments recently made with the "heavier-than-air" type of machine.

As a history the work is not very satisfactory, since it jumps to and fro from period to period, and anecdotes are frequently narrated without specifying the dates.

The book is fully illustrated, but though they include some reproductions of photographs of recent events, by far the greater number of the illustrations are from woodcuts which have already done service in "Travels in the Air" (published in 1871) and other older works. We must take strong objection to some of these old blocks being reproduced with new titles, such, for instance, as that on p. 185, entitled "Les Concours de Vincennes en 1900," and that on p. 201, "Ballon couvert de neige . . . . ascension de l'Aéro Club," both of which appeared in the above-named book; and especially that on p. 139, "Descente de Lhoste en Angleterre," which appears in "Travels in the Air," p. 307, as "Descent of the *Neptune* at Cape Grisnez." As this picture is a landscape with cliffs and a lighthouse, it cannot faithfully represent a scene on the English coast as well as one on the other side of the Channel!

TREATMENT OF HOME-WOODS.

The Garden Beautiful: Home-woods and Home Landscape. By William Robinson. Pp. xii + 170. (London: John Murray, 1907.) Price 7*s*. 6*d*. net.

THE author's expressed object in writing this book was to induce people fortunate enough to possess woodlands to make them attractive and accessible. Having already written the "English Flower Garden" and the "Wild Garden," he is careful in this case to point out that just as in the latter book his purpose was not to destroy the flower garden, so in the present instance the arguments in favour of beautifying the home-woods are intended to persuade proprietors "after thought of the needs of a true garden, to think more of their woods from æsthetic and other points of view."

We are quite in sympathy with Mr. Robinson when he states that there are hundreds of acres of beautiful woods in his district never seen by anyone but the gamekeeper. Yet how delightful the effects that may be obtained by opening up such woods, in a manner that paths are made available for foot visitors at all seasons of the year! On most estates no such thing is done, but we have in our mind several instances that afford striking testimony to the deprivations voluntarily or ignorantly suffered by those who maintain the woodlands as a closed book, so to speak, to all but sportsmen. One of these is at Keele Hall, in Staffordshire, the present residence of the Grand Duke Michael of Russia, where the woods, extending for a mile or more beyond the pleasure grounds, were

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laid out with suitable paths about forty years ago by the late Ralph Sneyd, uncle to the present owner of the estate.

The idea in carrying out such work should be that of bringing the most picturesque portions of the wood into view, and the paths should be arranged accordingly. It would be contrary to the spirit of the thing to try and make the woodlands a kind of pleasure-ground, for the woods are capable of yielding effects perfectly distinct from those which may be obtained from a pleasure-ground. No great amount of planting need be done, but by this statement we do not mean that regard for a supposed principle need prevent one from planting decorative shrubs, trees, or bulbs in positions where suitable sites are available for them, and the effect can thereby be greatly improved. In many situations where close planting has caused trees to develop fine, straight stems or trunks, there is no need for any under-shrub to complete the scene, for the lover of trees will have his delight in viewing the magnificent stems, often devoid of branches for twenty, or even thirty, feet from the ground.

But it is necessary, for change of scene, that in some places there should be a dense undergrowth of an evergreen shrub, such as the rhododendron, which is capable of thriving and even flowering well in comparative shade. The author of the present work rightly insists on the necessity of obtaining rhododendrons on their own roots for woodland planting, as they are usually capable of succeeding better than grafted plants, especially if the grafts have been worked on stocks of *R. ponticum.* Many gardeners have the idea that the old and somewhat unattractive *R. ponticum* is the hardiest of all rhododendrons, but this is erroneous. Some of the North American kinds are much hardier, and their effect when in flower is brilliant. Mr. Robinson specially recommends a variety known as "Cunningham's White," a most hardy plant of vigorous constitution, and bearing flowers of a rosy-lilac colour in bud, gradually becoming paler as the flowers expand. Other suitable species for forming undergrowth of a similar nature would include *Berberis aquifolium* (the evergreen barberry), *Ligustrum ovalifolium* (common privet), *Laurus nobilis, Gaultheria Shallon,* species of Hedera (ivy), Bambusa species, also common briars, bracken and furze, &c.

When once the owner of a wood, however, determines to make it accessible and attractive, he will soon discover various ways in which the views from the paths may be improved without interfering with the character of the wood itself. The sides of the paths can easily be planted with attractive, low-growing shrubs, and the scope for securing spring effects from flowering bulbs will be almost infinite. The bulbs from the forcing houses need never be thrown away, for suitable situations for them will present themselves in numerous instances, and snowdrops, crocuses, bluebells, and even the cheery little cyclamens may be planted in thousands.

The author reproduces two chapters from "The English Flower Garden," and then in subsequent chapters goes on to deal with the evergreen and deciduous trees of the northern forest, the best of native and European trees for the British Isles, how to produce wood and covert from seeds, and many other details connected with the subject, there being in all thirty-three chapters. We cannot agree with the suggestion on p. 76 that trees growing in isolated positions on lawns have their roots robbed by the grasses! in anything like the measure that obtains when the trees are growing together in a plantation. Mr Robinson's plea for the use of English names in garden literature we regard as unfortunate, unless the botanical names are employed also, as the use of popular names alone usually leads to the greatest confusion.

WATER SUPPLY.

Clean Water and How to Get It. By Allen Hagen. Pp. x+178; illustrated. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1907.) Price 6*s.* 6*d.* net.

THERE is probably no engineering topic at the present day of more striking importance to the public welfare than that relating to the supply of pure water for domestic purposes to large centres of population. Health, physical fitness, comfort and general well-being are all bound up in the solution of a problem which becomes daily increasingly difficult, and, at the same time, increasingly urgent, with the rapid growth and development of manufacturing towns, quite apart from the consideration of its equally essential application to the smallest hamlet and to the individual. An age which no longer recognises disease and degeneration as the unalterable and inscrutable decrees of a mysterious Providence, but as evils to be resolutely combated, with every hope of a successful issue, cannot for one moment tolerate the idea of polluted sources and germ-ridden channels for its supplies of water—that element so indispensable to existence and so inseparable a constituent of nature itself.

Any publication, therefore, which tends to throw additional light on the subject, or which collates and classifies data and information already acquired for the use of those engaged in the prosecution of waterworks, must be readily welcome. Mr. Hagen's book belongs to the latter class, and his object has been to set down some useful facts and principles for the guidance of those who have had no previous experience in the matter, and yet who are called upon, in connection with civic and urban duties, to participate in the control and distribution of water for their respective districts. The book is avowedly not intended for the expert, though even he may find some serviceable data among its pages. It is for the beginner and the "man in the street," in order that they may thereby be led to understand and appreciate something of the rudiments of a science of such vital concern to themselves and their fellow citizens.

Written exclusively from an American standpoint and based entirely on American practice, it is difficult on this side of the Atlantic to offer very effective criticism of its contents. Conditions here differ in so many respects as to afford little scope for useful com-

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